

including diastereomers, enantiomers and salts thereof

where

Z is -S-;

R<sub>1</sub>, R<sub>1ab</sub>, R<sub>1ac</sub> and R<sub>1ad</sub> are independently

- (1) hydrogen or R<sub>6</sub>,
- (2) -OH or -OR<sub>6</sub>,
- (3) -SH or -SR<sub>6</sub>,
- (4) -C(O)<sub>q</sub>H, -C(O)<sub>q</sub>R<sub>6</sub>, or -O-C(O)<sub>q</sub>R<sub>6</sub>, where q is 1 or 2,
- (5) -SO<sub>3</sub>H or -S(O)<sub>q</sub>R<sub>6</sub>,
- (6) halo,
- (7) cyano,
- (8) nitro,
- (9) -Z<sub>4</sub>-NR<sub>7</sub>R<sub>8</sub>,
- (10) -Z<sub>4</sub>-N(R<sub>9</sub>)-Z<sub>5</sub>-NR<sub>10</sub>R<sub>11</sub>,
- (11) -Z<sub>4</sub>-N(R<sub>12</sub>)-Z<sub>5</sub>-R<sub>6</sub>, or
- (12) -P(O)(OR<sub>6</sub>)<sub>2</sub>;

R<sub>1aa</sub> is -C(O)<sub>q</sub>H, -C(O)<sub>q</sub>R<sub>6</sub>, -Z<sub>4</sub>-NR<sub>7</sub>R<sub>8</sub>, -Z<sub>4</sub>-N(R<sub>9</sub>)-Z<sub>5</sub>-NR<sub>10</sub>R<sub>11</sub> or -Z<sub>4</sub>-N(R<sub>9</sub>)-Z<sub>5</sub>-R<sub>6</sub>;

R<sub>2</sub> and R<sub>3</sub> are each independently H, -Z<sub>4</sub>-R<sub>6a</sub>, or -Z<sub>4</sub>-NR<sub>7a</sub>R<sub>8a</sub>;

R<sub>4</sub>, R<sub>4a</sub>, R<sub>5</sub> and R<sub>5a</sub> are each independently hydrogen, alkyl, aryl, aralkyl, cycloalkyl, or heteroarylalkyl;

R<sub>6</sub>, R<sub>6a</sub>, R<sub>6b</sub> and R<sub>6c</sub> are independently alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, cycloalkenyl, cycloalkenylalkyl, aryl, aralkyl, heterocyclo, or heterocycloalkyl, each of which is unsubstituted or substituted with Z<sub>1</sub>, Z<sub>2</sub> and one or more groups Z<sub>3</sub>,

R<sub>7</sub>, R<sub>7a</sub>, R<sub>8</sub>, R<sub>8a</sub>, R<sub>9</sub>, R<sub>10</sub>, R<sub>11</sub> and R<sub>12</sub>

(1) are each independently hydrogen, or -Z<sub>4</sub>R<sub>6b</sub>; or

- (2)  $R_7$  and  $R_8$ , or  $R_{7a}$  and  $R_{8a}$  may together be alkylene, alkenylene, or heteroalkylene, completing a 3- to 8-membered saturated or unsaturated ring with the nitrogen atom to which they are attached, which ring is unsubstituted or substituted with  $Z_1$ ,  $Z_2$  and one or more groups  $Z_3$ , or
- (3) any two of  $R_9$ ,  $R_{10}$  and  $R_{11}$  may together be alkylene, alkenylene or heteroalkylene completing a 3- to 8-membered saturated or unsaturated ring together with the nitrogen atoms to which they are attached, which ring is unsubstituted or substituted with one or more  $Z_1$ ,  $Z_2$  and  $Z_3$ ;

$Z_1$ ,  $Z_2$  and  $Z_3$  are each independently

- (1) hydrogen or  $Z_6$ ,
- (2)  $-OH$  or  $-OZ_6$ ,
- (3)  $-SH$  or  $-SZ_6$ ,
- (4)  $-C(O)_qH$ ,  $-C(O)_qZ_6$ , or  $-O-C(O)_qZ_6$ ,
- (5)  $-SO_3H$ ,  $-S(O)_qZ_6$ , or  $-S(O)_qN(Z_9)Z_6$ ,
- (6) halo,
- (7) cyano,
- (8) nitro,
- (9)  $-Z_4-NZ_7Z_8$ ,
- (10)  $-Z_4-N(Z_9)-Z_5-NZ_7Z_8$ ,
- (11)  $-Z_4-N(Z_{10})-Z_5-Z_6$ ,
- (12)  $-Z_4-N(Z_{10})-Z_5-H$ ,
- (13) oxo,
- (14) any two of  $Z_1$ ,  $Z_2$ , and  $Z_3$  on a given substituent may together be alkylene or alkenylene completing a 3- to 8-membered saturated or unsaturated ring together with the atoms to which they are attached; or
- (15) any two of  $Z_1$ ,  $Z_2$ , and  $Z_3$  on a given substituent may together be  $-O-(CH_2)_q-O-$ ;

$Z_4$  and  $Z_5$  are each independently

- (1) a single bond,
- (2)  $-Z_{11}-S(O)_q-Z_{12}-$ ,
- (3)  $-Z_{11}-C(O)-Z_{12}-$ ,
- (4)  $-Z_{11}-C(S)-Z_{12}-$ ,
- (5)  $-Z_{11}-O-Z_{12}-$ ,
- (6)  $-Z_{11}-S-Z_{12}-$ ,
- (7)  $-Z_{11}-O-C(O)-Z_{12}-$ ,
- (8)  $-Z_{11}-C(O)-O-Z_{12}-$ ; or
- (9) alkyl

$Z_6$  and  $Z_{6a}$  are independently

- (i) alkyl, hydroxyalkyl, alkoxyalkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, cycloalkenyl, cycloalkenylalkyl, aryl, aralkyl, alkylaryl, cycloalkylaryl, heterocyclo, or heterocycloalkyl;
- (ii) a group (i) which is itself substituted by one or more of the same or different groups (i); or
- (iii) a group (i) or (ii) which is independently substituted by one or more of the groups (2) to (15) of the definition of  $Z_1$ ;

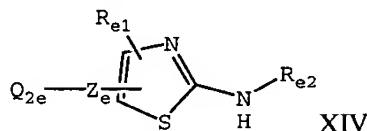
$Z_7, Z_8, Z_9$  and  $Z_{10}$

- (1) are each independently hydrogen or  $-Z_4-Z_{6a}$ ;
- (2)  $Z_7$  and  $Z_8$  may together be alkylene, alkenylene, or heteroalkylene completing a 3- to 8-membered saturated or unsaturated ring together with the atoms to which they are attached, which ring is unsubstituted or substituted with one or more  $Z_1, Z_2$  and  $Z_3$ , or
- (3)  $Z_7$  or  $Z_8$ , together with  $Z_9$ , may be alkylene, alkenylene, or heteroalkylene completing a 3- to 8-membered saturated or unsaturated ring together with the nitrogen atoms to which they are attached, which ring is unsubstituted or substituted with one or more  $Z_1, Z_2$  and  $Z_3$ ;

$Z_{11}$  and  $Z_{12}$  are each independently

- (1) a single bond,
- (2) alkylene,
- (3) alkenylene, or
- (4) alkynylene;

provided said compound is other than a compound of formula XIV



where

$Z_e$  is  $-S-$ ;

$Q_{2e}$  is phenyl optionally substituted with one group selected from halo, hydroxy, alkoxy nitro,  $-NH_2$ ,  $-alkyl(NH_2)$ ,  $-C(O)NH_2$ ,  $-alkylC(O)NH_2$  or  $-arylC(O)NH_2$ ;

$R_{e1}$  is H, alkyl, hydroxyalkyl, halogen or carboxy; and

$R_{e2}$  is H,  $-C(O)alkyl$ ,  $-SO_2alkyl$  or  $-C(O)phenyl$  optionally substituted with halogen.

9. A compound of claim 8 where

$R_2$  is hydrogen or alkyl; and

$R_3$  is  $-Z_4R_{6a}$ , where:

- (a)  $Z_4$  is a single bond and  $R_{6a}$  is heteroaryl optionally substituted with one or more  $Z_1, Z_2$  or  $Z_3$ ;